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(54) **METHODS, SYSTEMS, AND PRODUCTS FOR EVALUATING PERFORMANCE OF VIEWERS**

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(57) **ABSTRACT**

Methods, systems, and products are disclosed for evaluating the performance of a viewer watching media programming. The media programming is received and includes at least one of a live media program and a recorded media program. Display is caused of the media programming and a cue. The cue prompts the viewer during presentation of the media programming to provide a response to the cue within a time period. Upon receiving the response to the cue within the time period, then the response is detected and a response time of the response is measured. The response time is a time between occurrence of the cue and receipt of the response. The viewer's performance is evaluated by comparing the response time to a reference response time.

18 Claims, 3 Drawing Sheets
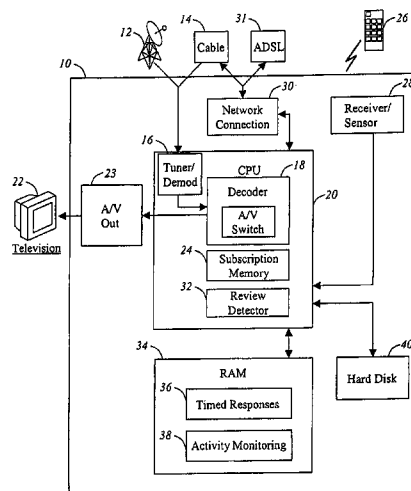
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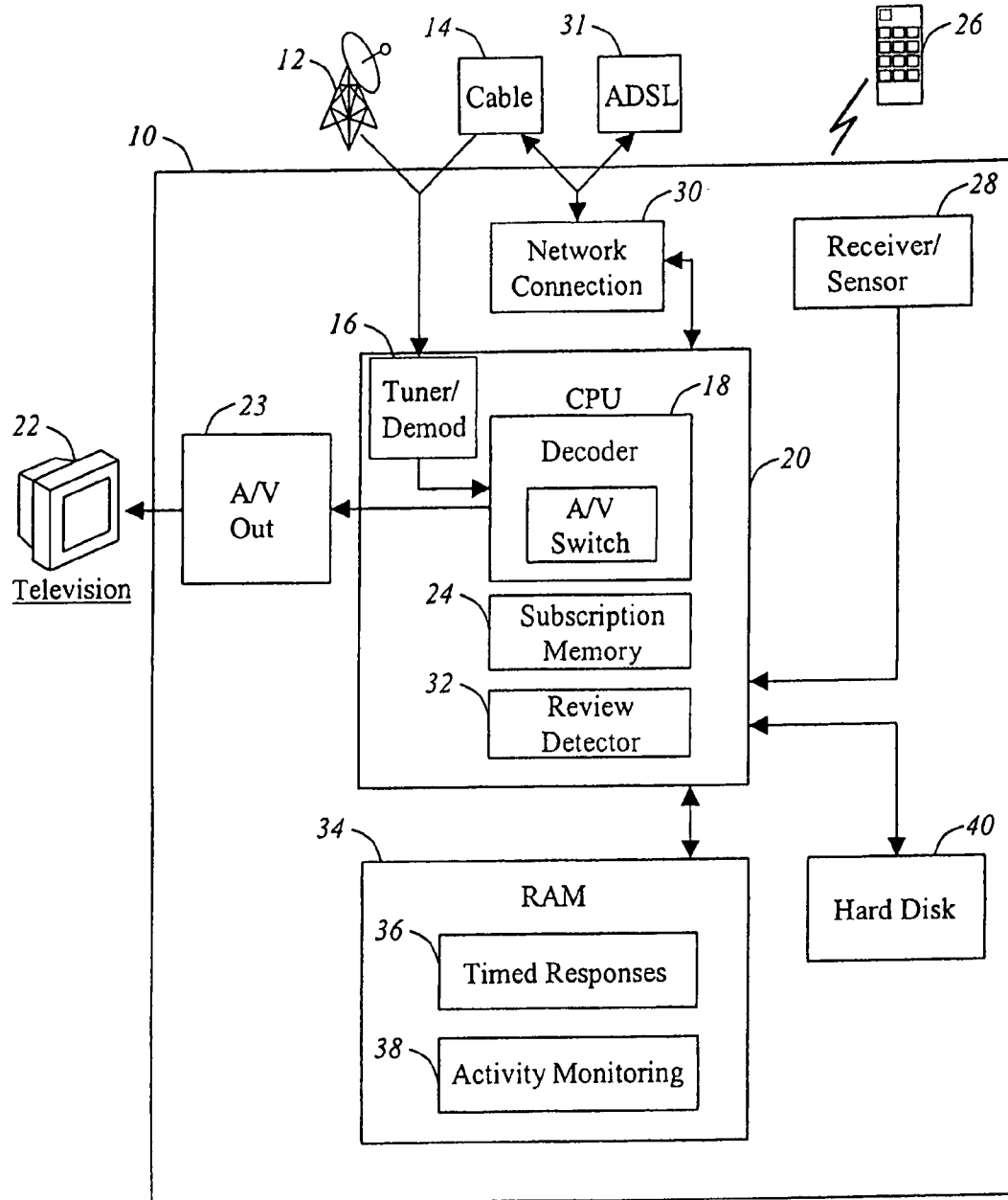U.S. Appl. No. 12/567,828, filed Sep. 2009, Gray.
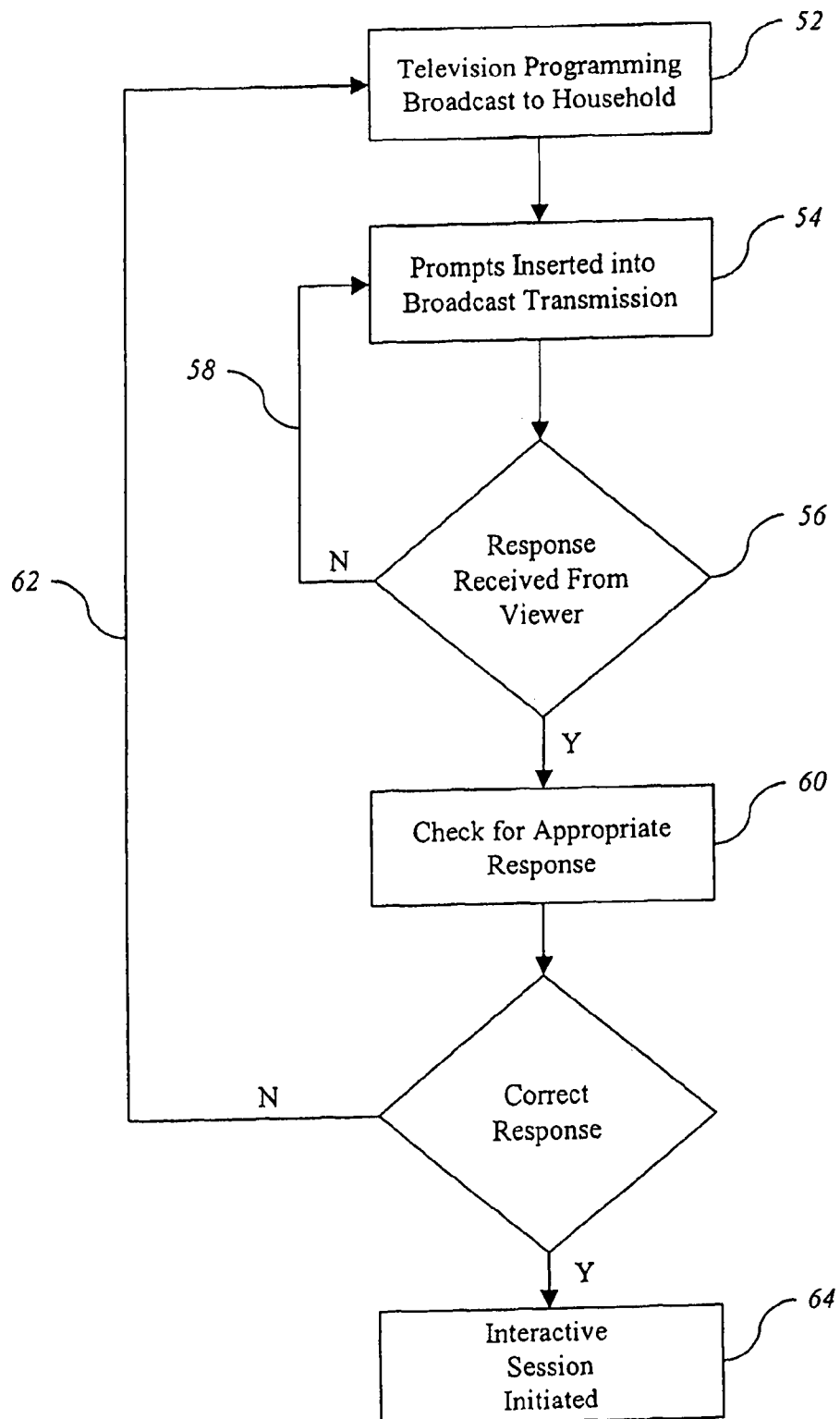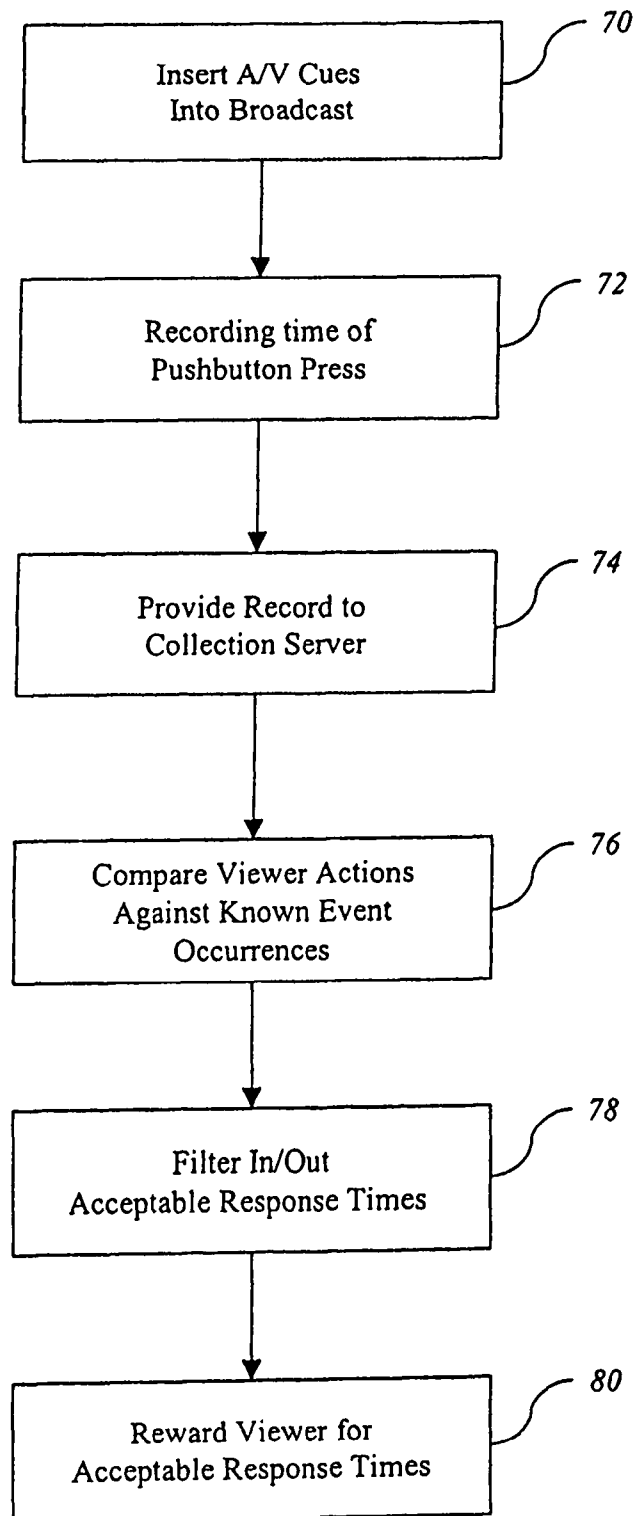
* cited by examiner

Fig. 1.

Fig. 2.

```
┌─────────────────────────┐
│     Insert A/V Cues      │  ⟋ 70
│     Into Broadcast       │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│     Recording time of    │  ⟋ 72
│     Pushbutton Press     │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│     Provide Record to    │  ⟋ 74
│     Collection Server    │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│   Compare Viewer Actions │  ⟋ 76
│   Against Known Event    │
│   Occurrences            │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│      Filter In/Out       │  ⟋ 78
│  Acceptable Response Times│
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│      Reward Viewer for   │  ⟋ 80
│  Acceptable Response Times│
└─────────────────────────┘
```

Fig. 3.

METHODS, SYSTEMS, AND PRODUCTS FOR EVALUATING PERFORMANCE OF VIEWERS

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation of U.S. patent application Ser. No. 11/183,450, filed Jul. 18, 2005 and now issued as U.S. Pat. No. 7,269,835, which is itself a continuation of U.S. patent application Ser. No. 10/036,677, filed Dec. 21, 2001 and now issued as U.S. Pat. No. 7,086,075.

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BACKGROUND

The exemplary embodiments generally relate to the field of managing television viewing activities. More specifically, the exemplary embodiments relate to advertising management systems and methods in which timed responses to audio/video (A/V) events in television programming are presented, responded to, and/or tracked.

Advertisements and content may be displayed in between and during the subject portions of television programming. Advertisements are the primary source of revenue for television networks and a major component in the generation of revenue for advertisers. In one example, advertisements are typically ten to ninety seconds in length, and are grouped together as pre-selected breaks in the broadcast of a program, typically occurring from every few to every fifteen minutes of programming. In another example, advertising may be accomplished by subtly placing products within the subject portion of a broadcast, such as during movies, sitcoms, sporting events, etc. The number of advertisements and the timing between the placement of the advertisements is dependent on the type of program and the format of the program (e.g., live or pre-recorded). Television programming typically includes approximately sixteen minutes of advertisements during every hour of programming, providing a large amount of time to present information to consumers. Many advertisers use this time as their primary avenue for promoting products, content, services, and events to consumers.

Television advertising and content is generally more effective when aired during popular television programs that are watched by many viewers who are interested in the types of products or services being advertised. "Targeted advertising" refers to identifying a group of people as being those that have the greatest interest in what is being advertised, and providing the most favorable situation in which the advertisement will reach that pre-determined group of consumers. Advertisers reach these pre-determined groups by strategically placing advertisements and content based on the time of the day, the popularity of a subject program, and the type of advertisement or content shown. Displaying an advertisement to a large audience results in more potential consumers receiving the advertisement, which is likely to result in more revenue being generated. In determining whether a television program may be appropriate for a particular advertisement, advertisers consider viewer categories such as age, gender, income level, and viewer interests.

Broadcasting networks and advertisers are able to gauge which demographic groups are watching which programs using conventional market research tools. For example, the AC Nielsen™ ratings system tracks television viewing activities by sampling a plurality of households, and estimating the number of viewers of particular programs using the viewing activity data.

In order to gauge the effectiveness of their spending, advertisers have long sought information related to potential consumer viewing patterns. There are several conventional devices and techniques that exist for gathering such information. For example, U.S. Pat. No. 4,258,386 issued to Cheung discloses "an apparatus for television audience analysis comprising means for monitoring a television receiver, means responsive to a monitored signal for storing information representative of channel identification and of the time at which a channel is selected and at which the selection of a channel is terminated, and means for reading the stored information periodically."

As another example, U.S. Pat. No. 4,556,030 issued to Nickerson, et al., discloses "a data storage and transmission system for accumulating and transmitting data from a plurality of remote T.V. panelist locations to a central location. Each remote unit includes a microprocessor, a control memory, and a data store memory. The control memory stores control information for the remote unit, which may include dynamic allocation information. The data store memory is event driven and stores data as to television channel selection and times thereof, and can store viewer reaction data and the like. At a pre-selected time, each remote unit initiates a telephone call to a central location and identifies itself. Upon successful telephone connection between a remote unit and the central location, any data such as viewer habit and/or reaction data and the like contained in the data store memory is transmitted over the telephone line to the central location."

Other conventional systems and methods provide somewhat more use data than only channel numbers viewed and the time of viewing, such as which products panelists purchase. U.S. Pat. No. 4,816,904 issued to McKenna, et al., discloses "a data gathering system including a plurality of remote units which are controlled from a central location. Each of the remote units are attached to a television receiver which is generally, but not necessarily, attached to a cable system. Each of the remote units may function to determine which of several TV modes is in use as well as to store TV channel selector data, data from an optical input device, and/or data input by viewers representative of the composition of the viewing audience. The data is stored for either later collection by a portable data collector, or for direct transmission via telephone to the central location. A video message for a TV viewer, such as a survey, may be transmitted from the central location and stored at the remote units, for later display on the TV receiver associated with the remote units. The substitution of alternate programming information may also be achieved by the central control point on selected of the remote units."

Conventionally, panelist monitoring may be used to gauge the effectiveness of advertising and content on a selected group of panelists. Nevertheless, while panelist monitoring systems like those described above provide somewhat more monitoring data than just TV tuning data, they do so only for limited groups. For example, when more data is gathered (like purchase information), it is done only for the panelist groups, rather than for subscribers of the entire system.

Conventional systems typically capture ratings information that identifies which television shows are viewed, rather than whether the subscriber also viewed the commercials

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displayed during those shows. What is important to an advertiser is that potential consumers are interested in an advertisement enough to sit through its duration. There is a great deal of money invested in advertising, with the hopes that it will return even greater profits. Conventional systems do not result in adequate amounts of viewing information and feedback being generated, and are not efficient in presenting the information to and rewarding viewers for participating in television programming.

Accordingly, there are needs for gathering more detailed viewer information, establishing two-way communication with a viewer in order to collect the detailed information, and systems and methods for processing the detailed information in order to accomplish the goals of both a viewer and a provider, such as, for example, requesting certain types of information and receiving information and incentives based upon viewer participation.

SUMMARY

According to exemplary embodiments, the needs described above and other needs are met by providing highly efficient systems and methods whereby audio/visual cues and/or events are presented to viewers of a television program, advertisement, and/or other content. Some of the systems and methods include recording response times to the audio/visual cues or events provided by the viewer by actuating a key on a user input device, such as a remote control unit. Viewer response times are then processed and evaluated for the purposes of competition, discounts, incentives, awards, polling, surveying, and/or other purposes.

Some of the embodiments of this invention present a cue and/or event to a viewer to using standard or time-tag enhanced television programming (or other media programming) and any conventional set top box (or alternate media delivery device) equipped with demographics and programming collection and analysis systems that may be deployed for use on an interactive media delivery system.

Some of the embodiments of this invention builds upon the ability of a set top box processor to record the actions of a viewer while watching television. By actuating a key on a remote control unit based upon audio/visual cues, viewer behavior may be recorded, transmitted if necessary, and then processed in order to evaluate the viewer behavior. Since each viewer action is time-stamped, a recreation of the viewer action sequence in time may be generated, which may be compared against any known sequence of events.

In the exemplary embodiments, a television programming stream (network show, advertisement, gaming program, polling program, survey program, etc.) is presented over a particular period of time may include one or more intentional or incidental occurrences of audio/video content or events, such as the display of products, a word, a sound, an action by an actor, an effect, or any other recognizable event. Responses to these cues may be used as part of an award, incentive, measurement, market test, individual skill (including visual) measurement, marketing, customer sensitivity to product measurement program, and game/contest/entertainment device.

According to an exemplary method for providing an incentive for a viewer to watch network programming, a prompt (also referred to herein as a "cue") is presented with the television programming stream (or alternate media stream) to provide an indicated response to an event within an indicated time period. The viewer may react and respond to the prompt by actuating a pushbutton of a remote control device (or other means for communicating a response to the prompt to the set-top box). Thereafter, the response to the event is detected,

a response time of the indicated response to the event is measured, viewer performance is evaluated based upon the response time, and the incentive may be presented to the viewer based upon the response time. The incentive may be presented with the television programming stream or with an alternate media stream to the set-top box.

The event may comprise one or more intentional or incidental occurrences of audio/visual content broadcast to the viewer during the television programming stream. The indicated response to the event may be time-stamped and used to create a viewer's action log from the indicated response and the response time, which may be compared against any known sequence of events.

In one of the exemplary embodiments, the indicated response to the event is provided by the viewer actuating a pushbutton key on a set-top box remote control unit which transmits an encoded signal when the viewer identifies the one or more intentional or incidental occurrences of audio/visual content.

In another exemplary embodiment, a display device of a media delivery device presents an incentive to a viewer to watch network programming. The media delivery device includes a decoder operable for decoding broadcast media programming into the media delivery device, a processor operable for generating incidental or intentional occurrences of audio/visual cues to be inserted into the media delivery device, a sensor operable for detecting viewer responses to the incidental or intentional occurrences of audio/visual cues, a processor operable for measuring the response time of the viewer's response, and a processor operable for evaluating the viewer's response by comparing the response time against any known sequence of events, the results of which are used to provide an incentive to the viewer based upon the evaluation.

In a further exemplary embodiment, the media delivery device includes a network connection operable for transmitting encoded signals between the media delivery device and an external network, and wherein the media delivery device receives prompts from the external network and the external network receives notification for the viewer's response and the response time.

Other systems, methods, and/or computer program products according to some of the embodiments will be or become apparent to one with skill in the art upon review of the following drawings and detailed description. It is intended that all such additional systems, methods, and/or computer program products be included within and protected by this description and be within the scope of this invention.

DESCRIPTION OF THE DRAWINGS

The above and other embodiments, objects, uses, advantages, and novel features are more clearly understood by reference to the following description taken in connection with the accompanying figures, wherein:

FIG. 1 is an exemplary schematic diagram of a set top box according to an exemplary embodiment of some of the embodiments of this invention;

FIG. 2 is a flow diagram for prompting a viewer during a television broadcast and recording viewer response times using the set top box of FIG. 1 according to another exemplary embodiment of some of the embodiments of this invention; and

FIG. 3 is a flow diagram for providing rewards and incentives to a viewer who responds in an appropriate manner to one or more audio/visual cues using the set top box of FIG. 1.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

The exemplary embodiments now will be described more fully hereinafter with reference to the accompanying drawings. The exemplary embodiments may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. These embodiments are provided so that this disclosure will be thorough and complete and will fully convey the scope of the invention to those of ordinary skill in the art. Moreover, all statements herein reciting embodiments of the invention, as well as specific examples thereof, are intended to encompass both structural and functional equivalents thereof. Additionally, it is intended that such equivalents include both currently known equivalents as well as equivalents developed in the future (i.e., any elements developed that perform the same function, regardless of structure).

Thus, for example, it will be appreciated by those of ordinary skill in the art that the diagrams, flowcharts, illustrations, and the like represent conceptual views or processes illustrating systems, methods and computer program products embodying some of the embodiments of this invention. The functions of the various elements shown in the figures may be provided through the use of dedicated hardware as well as hardware capable of executing associated software. Similarly, any switches shown in the figures are conceptual only. Their function may be carried out through the operation of program logic, through dedicated logic, through the interaction of program control and dedicated logic, or even manually, the particular technique being selectable by the entity implementing some of the embodiments of this invention. Those of ordinary skill in the art further understand that the exemplary hardware, software, processes, methods, and/or operating systems described herein are for illustrative purposes and, thus, are not intended to be limited to any particular named manufacturer.

Referring now to the drawings, in which like numerals indicate like elements throughout the several figures, FIG. 1 illustrates an exemplary hardware environment in which a conventional set top box (STB) 10, such as a set top box operable for monitoring viewing habits and collecting information, receives encoded television signals either from a satellite receiver 12 or a cable feed line 14, which is fed to a tuner/demodulator 16 for receiving digital signals. The STB 10 may be similar to the STB described in U.S. application Ser. No. 09/496,825, filed Feb. 1, 2000, which is incorporated herein by reference. The digital signals are divided into audio and video (A/V) signals. The tuner/demodulator 16 tunes to the frequency of a broadcast stream that is selected by a viewer. The tuner/demodulator 16 feeds into a decoder 18 in a central processing unit (CPU) 20 in the set top box 10. The tuner 16 tunes to the frequency of a selected decoder 18 transport stream which is then decoded and fed to the television 22 via A/V out jacks 23.

Programming subscription memory 24 in the CPU 20 maintains a list of television stations that are available to the viewer in accordance with the subscription plan arranged by the user of the STB 10. In order to select a channel, the CPU 20 either receives signals from a user input device, such as a remote control unit 26 via a remote control sensor 28, or receives signals from the television unit 22. The STB 10 includes a control interface for accepting viewer commands from the remote control unit 22.

The STB 10 includes a network connection/modem 30 by which the set top box 10 may transmit and receive data from the cable or satellite television system provider. The network connection modem 30 may include an asymmetric digital subscriber line (ADSL) 31 modem or a cable modem. In conventional satellite television systems, the STB 10 initiates a call to the satellite system service provider in order to provide billing information, such as movie purchases.

The STB 10 additionally includes a television review detector 32. The detector 32 receives responses from a television viewer that is using the interactive two-way communication method of some of the embodiments of this invention, as will be described below, via the remote control unit 26 and the remote control sensor 28. A random access memory module (RAM) 34 is operable for storing files and includes a timed response monitoring module 36, which time stamps a viewer's indicated response, and a viewer action's monitoring module 38, which monitors the viewer's indicated responses. The RAM module 34, timed-response monitoring module 36, and viewer action's monitoring module 38 are accessed by the CPU 20 during the operation of the two-way communication method of some of the embodiments of this invention. Memory intensive files may be stored in a hard disk 40.

Persons skilled in the art will recognize that some of the embodiments of this invention may be used with any of a variety of interactive media delivery systems, standard or wireless cable television systems, satellite television systems, internet protocol television (IPTV), and/or other media delivery systems that allow duplex communication (perhaps with the return path via a separate (e.g. telephone, cable, data, satellite, etc.) network) to the STB 10 coupled to the viewer's television set 22 or alternate display device or the like. Some of the embodiments of this invention may be used in conjunction with additional demographics and programming ratings collection systems that may be deployed for use on an interactive media delivery system.

The CPU 20 in the STB 10 collects information to create a log relating to all or selected events of interest. An event is defined as an action or a change in the state of the STB 10 that is deemed important to building a knowledge base on particular viewers, their viewing patterns, and viewer response behavior. The CPU 20 records response times to audio/visual cues or events provided by the viewer through the actuation of a key on a user input device, such as a remote control unit 26. Viewer response times are then processed and evaluated for the purposes of competition, discounts, incentives, awards, polling, voting, surveying, and other purposes.

Broadly stated, some of the embodiments shown in FIG. 1 build upon the ability of the STB processor 18 to record the actions of a viewer while watching television. By actuating a key on a remote control unit 26 based upon audio/visual cues, viewer behavior may be recorded, transmitted if necessary, and then processed in order to evaluate the viewer behavior. Since each viewer action is time-stamped, a recreation of the viewer action sequence in time may be generated, which may be compared against any known sequence of events.

According to an exemplary embodiment, a television programming stream (network show, advertisement, gaming program, polling or survey program, etc.) presented over a particular period of time may include one or more intentional or incidental occurrences of audio/video content or events, such as the display of products, a word, a sound, an action by an actor, an effect, or any other recognizable event. Responses to these cues may be used as part of an award, incentive, measurement, market test, individual skill (including visual) measurement, marketing, customer sensitivity to product measurement program, competition, contest, and/or entertainment device.

FIG. **2** is a flowchart illustrating the steps involved in collecting and analyzing event data and delivering incentives, and the like, for the interactive session model, according to some of the embodiments of this invention. While the steps described herein and illustrated in the flowchart contain many specific examples of information, these steps should not be construed as limitations on the scope of the invention, but rather as examples of steps that could be used to practice the invention.

In step **52**, a new interactive session may begin when a television broadcast is transmitted to a television set **22** through the STB **10**. As described in FIG. **1**, the viewer may access television stations included in the viewer's programming subscription via a user input device, such as a remote control unit **26** via a remote control sensor **28**. The viewer's remote control unit **26** may include a dedicated "interactive session" pushbutton, or the viewer may actuate one or a series of pushbuttons in response to a prompt that is displayed on the television set **22**, STB **10**, or broadcast as an audio signal. Although there may be one or more dedicated pushbuttons on the remote control unit **26** for responding to prompts, the interactive system may utilize remote control unit **26** pushbuttons for multiple purposes.

The viewer may also be required to identify himself/herself using a personal identifier, such as a personal identification number (PIN). The personal identifier may be used to distinguish between different members of a household. In an alternative embodiment, the interactive system may be configured to automatically begin or continue a previously initiated session each time the television set **22** is turned on.

To initiate an interactive session, instruction signals or prompts may pre-exist in the content stream or may be inserted into the content stream by the CPU (**20**, FIG. **1**) at step **54**, and are provided to the viewer through any of the methods described above. The CPU **20** acts upon the incoming content stream from the tuner/demodulator (**16**, FIG. **1**) and decode (**18**, FIG. **1**) and may superimpose any new audio/video cues upon that stream. The STB **10** may provide a display that prompts the viewer to actuate one or a series of pushbuttons on the viewer's remote control unit **26** at specific times during the broadcast transmission. An example of a display prompt may include such visual cues as "start" displayed in the corner of the television **22** screen, an audible beep or word, or the appearance of a product within a subject program.

In step **56**, the STB **10** of FIG. **1** detects if a response to an instruction or prompt is received through the infrared (IR) sensor (**28**, FIG. **1**) of the STB **10** and the television review detector (**32**, FIG. **1**). In step **58**, if there is no response received from the viewer, a second prompt may be inserted into the broadcast transmission. The second prompt may be inserted after a pre-determined time period, a minute for example, in order alert the viewer to the interactive session in case the viewer missed the first prompt. In one embodiment, additional prompts may be inserted into the broadcast transmission at various time intervals, such as every fifteen minutes, every half-an-hour, or every hour, for the purpose of informing the viewer that an interactive session may be initiated.

In step **60**, after it has been detected that a response has been received from step **56**, the system checks whether the viewer has entered an appropriate response to a prompt. The particular configuration of the system depends upon whether the prompt is generally located in the STB **10** or broadcast by the network. For example, if the prompt is generated by the CPU **20** of the STB **10**, then the response activity monitor **38** detects whether the viewer responds within a certain number

of seconds after the prompt is generated. However, if the prompt is broadcast by the television network, then the response activity monitor **38** may periodically download codes and acceptable response timing information via the network connection **30** from the television network. In such case, the STB **10** maintains a database of remote controller codes and corresponding time periods when the codes are to be transmitted by a viewer.

If a viewer response is not received in the STB **10**, the system in step **62** continues the broadcasting of the television programming in step **50** in the normal fashion. However, in step **64**, if the viewer provides an appropriate response within the proper time then an interactive session has been initiated, the details of which are discussed below.

FIG. **3** is a flow diagram illustrating an interactive session in which rewards and incentives may be provided to a viewer who responds in an appropriate manner to one or more audio/visual cues using the set top box of FIG. **1**. At step **70**, once an interactive session has been initiated by a viewer (step **64**, FIG. **2**), one or more audio/visual (A/V) cues are inserted into the television broadcast stream or alternate media programming (e.g., gaming application). The television broadcast stream (network show, advertisement, etc.) presented over a particular period of time may include one or more intentional or incidental occurrences of A/V content or events, such as the display of products, words, sounds, actions by an actor, effects, or any other recognizable event. The AN cues may be presented for the purpose of obtaining and receiving information, incentives, awards, measurements, marketing information, viewer skill measurements, customer interests, voting, polling, and/or contests.

At step **72**, the STB **10** records when a pushbutton is actuated and the time at which the press was performed. At step **74**, the STB **10**, when appropriate, provides the pushbutton time record of viewer actions to a collection server at the data-center/head-end of the operator of the interactive system (e.g., cable operator, direct-to-home satellite video operator, advertiser, etc.). The record of viewer actions may then be compared at the data-center against a known sequence of event occurrences provided by the content programmer, in step **76**. The known sequence of events occurrences may be provided as a time/event listing that may be stored as an electronic database file. The comparison may be done to determine which known events were detected by the viewer and the latency associated with the viewer's actuation of the designated pushbutton. At step **78**, the latency between event presentation and viewer action may, if desired, be used to filter in/out acceptable response times for various purposes.

Given that viewer identity is known based upon viewer identification, as described above, at step **80** the viewer may be rewarded or otherwise recognized for their diligent viewing of the presentation and appropriate time responses to A/V cues. The interactive system may retrieve the viewer's account information and display a description of the awards that are available to that viewer based upon the viewer's response times and number of correct responses.

In one embodiment, the STB **10** connects to and sends viewer identification information and response data to an external network via the network connection **30** described above. The operation of the external network may be sponsored by the cable television provider or the digital satellite network. Alternatively, the external network may be operated by a separate market research company affiliated with the cable television provider or the digital satellite network. As another option to increase the effectiveness of the interactive system with regards to advertising, a viewer's time response data may be transmitted through the STB **10** directly to a

vendor. For example, if a viewer presses the remote control key within an appropriate amount of time when a well known beverage can is displayed in a movie, the vendor may then directly provide the viewer with an award, such as a coupon for the beverage received in the mail. In that case, the STB **10** transmits a signal through the network connection **30** to indicate that the viewer is to receive a coupon. The signal may include a viewer identification number, the date at which the interactive session took place, the response times of the viewer, and the particular product or service being presented to the viewer.

The methods and systems of some of the embodiments of this invention may be used to sponsor various viewing incentive activities, such as activities and competitions for individual and multiple viewers to note and respond to events, whereby viewers with the either individually or comparatively highest score based on events noted and response times may receive special awards, prizes, discounts on products, etc. A/V cues may be sent at the beginning of a program and may include may include examples such as "Find the 15 times that a widget is displayed during this movie and receive a $1 discount coupon for a widget purchase", "The three highest scores noting each time an advantage of the new widget is mentioned will receive a free one", and scoring a boxing match along with the judges. Given that there are multiple pushbuttons on a remote control unit **26**, it is possible for multiple events to be tracked, recorded, and evaluated simultaneously.

Viewer response time data may be sent through the STB **10** to the data-center for the purpose of confirming, in creative ways, that the viewer is experiencing a program. Viewers may generate an additional interest in a program if they are rewarded for participating.

Additional uses of this systems and methods may include evaluating viewer response times for marketing purposes, such as the number of viewers participating in events, viewer performance, and incentives awarded. These marketing tools may provide advertisers and content managers with data which may lead to product placements in programming and viewer awareness of products within a television program including product sensitivity. In addition, appropriate responses and response times may be evaluated to measure individual viewer skills, such as visual and audio skill measurements. For example, visual tracking problems may be tested, evaluated, and trained. In another example, audio pitch skills may be broadcast and tested. A musical note may be broadcast and a response given identifying the note, such as the difference between an "A" and a "C". Skills testing may be accomplished based upon response times

Some of the embodiments of this invention may be enabled for positive instant-feedback to the viewer or delayed feedback to the viewer. In a STB **10** without substantial internal processing, logic, and extra programming associated with it, the interactive system of some of the embodiments of this invention may be restricted to a delayed-type feedback system in which the post processing of viewer reactions take place. In this type of system, viewer actions and response times may be sent to through the STB **10** to a data-center where they are processed. Processing may include determining whether or not response times match up correctly or adequately relative to other individuals or a known set of events. A response may then be provided back to the user via email, the telephone, or U.S. mail.

In a positive instant-feedback system in which a STB **10** is capable of more substantial logic and processing, the system may provide instant feedback to a viewer. For example, if a viewer respond to a specific A/V cue in an appropriate amount

of time, the STB **10** may temporarily display an A/V cue back to the viewer, such as a check-mark or a thumbs-up symbol displayed in the corner of the television set **22** display. In a further embodiment, a rolling tally may be displayed which provides the viewer with a score, the score being based upon correct responses and response times. Data item/tags may be placed within an A/V stream at specific time points. These tags may be inserted by the program provider and indicate that an event item is being presented at a certain time within a show. The tag may also indicate the time within which a response is required as well as the specific remote control unit **26** button to be actuated. A STB **10** equipped to detect the in-stream tags may then monitor an action by the viewer which, if detected, may generate an audio or visual feedback indicating whether the viewer response has occurred within the timeframe required and perhaps if the correct pushbutton has been actuated.

To illustrate some of the embodiments of this invention in a real-world example, assume that a viewer has chosen to watch a Sunday afternoon football game. As a subscriber of television programming utilizing some of the embodiments of this invention, the viewer is shown a prompt at the very beginning of the game. The prompt is displayed as a visual message appearing in the corner of the television set **22** display. The prompt is inserted into the broadcast transmission by the CPU **20**. The prompt may read, for example, "Click on your remote control every time the camera pans to the Gatorade™ cooler on the sidelines. Identify it within five seconds three times in a row and receive $1 off your next purchase."

The viewer may opt to participate in the session by actuating a pushbutton on the remote control unit **26**, or may opt not to proceed and actuate a cancel button on the remote control unit **26**. When a viewer opts not to participate, all prompts will be discontinued to that viewer for a certain period of time, perhaps until the next show, or in another example, not until the next time that the viewer turns on the television set **22**.

Assume for the purposes of this example that the viewer decides to participate in the interactive session. The football game begins and the first time that the Gatorade™ cooler appears the viewer actuates a pushbutton on the remote control unit **26** within five seconds of the appearance of the cooler. The remote sensor **28** sends an encoded message to the STB **10** where the CPU **20** time stamps the indicated response and sends it to a data-center via the network connection **30**, where the timed response meets the requirements of the known sequence of events. The viewer then responds within five seconds to a second and third appearance of the cooler within the five second time designation. At this point, the viewer has fulfilled the requirements of the session and now qualifies to receive the coupon. The coupon may be sent via the U.S Postal Service or via email, where it may be printed by the viewer.

To illustrate the use of some of the embodiments of this invention in a second real-world example, assume that an advertiser desires to collect information relating to the placement of the advertiser's product within a movie. Assume that BMW™ has paid to have one of their automobiles used in a new action movie. The star of the movie drives the car in six different scenes, and in those six scenes the BMW™ emblem is shown. To collect information relating to the effectiveness of the placement of the automobile, the advertiser may employ some of the embodiments of this invention.

Viewers subscribing to the interactive media service of some of the embodiments of this invention are prompted at the beginning of the movie by the media delivery service of the details of the session. To initiate a session, a viewer accepts the session by actuating a pushbutton on their remote

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control unit **26** which includes a sensor **28** that sends an encoded signal to the STB **10**. Each time that the automobile appears, each time being a visual cue, the viewer actuates a pushbutton on their remote control unit **26**. The STB **10** receives an encoded signal from the remote control unit **26** and time stamps the response and sends it to a data center via the network connection **30**. In another example, the STB **10** collects each viewer response, time stamps it, and then transmits all of the time-stamped viewer actions to the data center at the conclusion of the movie.

The advertiser may then compare viewer actions to the known sequence of automobile occurrences in order to determine the effectiveness of product placement. The comparison information may be used as a marketing tool and for future product placement decisions. A viewer response log may be sent to each viewer detailing their performance.

While several exemplary embodiments of this invention are described herein, various modifications and alternate embodiments will occur to those of ordinary skill in the art. For example, other protocol requests for a media programming stream, such as Hyper-Text Transfer Protocol (HTTP) and/or other protocols utilizing various formats, such as URL formats, Extensible Style Sheet (XSL) formats, Real Simple Syndication (RSS) that uses XML structures and others may be similarly used to communicate the programming media stream from a content source and used to communicate the response (to a prompt or cue). Accordingly, some of the embodiments of this invention are intended to include those other variations, modifications, and alternate embodiments that adhere to the spirit and scope of this invention.

What is claimed is:

1. A method, comprising:
receiving media programming at a media delivery device;
generating prompts by a processor in the media delivery device;
simultaneously displaying multiple ones of the prompts during the media programming to prompt a viewer to provide responses;
simultaneously receiving multiple responses as sequences of actions in response to the multiple ones of the prompts;
determining a time when each action occurs in the sequences of actions;
comparing the sequences of actions to events;
determining an action in the sequences of actions matches one of the events;
determining a latency between the time of the one of the events and the time of the action; and
evaluating a performance of the viewer by comparing the latency to a reference response time.

2. The method of claim **1**, further comprising providing an incentive to the viewer based on evaluation of the performance of the viewer.

3. The method of claim **1**, further comprising communicating the sequences of actions to a server.

4. The method of claim **1**, further comprising disregarding the action when the latency exceeds the reference response time.

5. The method of claim **1**, further comprising inserting the prompts into the media programming.

6. The method of claim **1**, further comprising awarding an award based on the latency.

7. The method of claim **1**, further comprising receiving a personal identification number associated with the viewer that distinguishes the viewer from another viewer.

8. A system, comprising:
a processor; and
memory for storing code that when executed causes the processor to perform operations, the operations comprising:
receiving media programming;
generating prompts;
simultaneously displaying multiple ones of the prompts during the media programming to prompt a viewer to provide responses;
simultaneously receiving multiple responses as sequences of actions in response to the multiple ones of the prompts;
determining a time when each action occurs in the sequences of actions;
comparing the sequences of actions to events;
determining an action in the sequences of actions matches one of the events;
determining a latency between the time of the one of the events and the time of the action; and
evaluating a performance of the viewer by comparing the latency to a reference response time.

9. The system of claim **8**, wherein the operations further comprise providing an incentive to the viewer based on the performance of the viewer.

10. The system of claim **8**, wherein the operations further comprise sending the latency to a server.

11. The system of claim **8**, wherein the operations further comprise sending the action to a destination.

12. The system of claim **8**, wherein the operations further comprise prompting the viewer to push a button.

13. The system of claim **8**, wherein the operations further comprise awarding an award based on the latency.

14. A computer readable memory storing instructions that when executed cause a processor to perform operations, the operations comprising:
receiving media programming;
generating prompts;
simultaneously displaying multiple ones of the prompts during the media programming to prompt a viewer to provide responses;
simultaneously receiving multiple responses as sequences of actions in response to the multiple ones of the prompts;
determining a time when each action occurs in the sequences of actions;
comparing the sequences of actions to events;
determining an action in the sequences of actions matches one of the events;
determining a latency between the time of the one of the events and the time of the action; and
evaluating a performance of the viewer by comparing the latency to a reference response time.

15. The computer readable memory of claim **14**, wherein the operations further comprise providing an incentive to the viewer based on the performance of the viewer.

16. The computer readable memory of claim **14**, wherein the operations further comprise sending the latency to a server.

17. The computer readable memory of claim **14**, wherein the operations further comprise sending the action to a destination.

18. The computer readable memory of claim **14**, wherein the operations further comprise prompting the viewer to push a button.

*   *   *   *   *